REMARKS

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and amended as necessary to more clearly and particularly describe the subject matter which applicant regards as the invention.

The Examiner rejected claims 1 and 2 under 35 U.S.C. 112, sixth paragraph. Specifically, the Examiner stated that the phrases "priority parameter required value determining means," "base gait parameter setting means," "priority parameter asymptotic means," "new gait parameter determining means," and "new normal gait parameter searching means" include means plus function limitations, but the written description fails to sufficiently disclose the corresponding structure, material or acts for the claimed functions. Applicant respectfully disagrees.

In regards to claim 1, the acts for performing "priority parameter required value determining means" are described in paragraphs [0177] through [0180], see specifically paragraph [0179], and is step S026 in FIG. 9 and is illustrated in FIG. 16.

The acts for performing "base gait parameter setting means" are described in paragraphs [0181] through [0187], see specifically paragraph [0186], and is illustrated in FIG. 17, Step S2100.

The acts for performing "priority parameter asymptotic means" are described in paragraphs [0188] through [0212], see specifically paragraph [0210], and is illustrated in steps S2102-1, S2102-2,...S2102-n in FIG. 17.

The acts for performing "new gait parameter determining means" are described in paragraphs [0188] through [0212], see specifically paragraph [0210],

and is illustrated in steps S2104-1, S2104-2,...S2104-n in FIG. 17 and further in the flowcharts in FIGS. 14, 18, and 19.

In regards to claim 2, the acts for performing "priority parameter required value determining means" are described in paragraphs [0127] through [0139], see specifically paragraph [0138], and is step S022 in FIG. 9 and is illustrated in FIG. 10.

The acts for performing "base gait parameter setting means" are described in paragraphs [0141] through [0146], see specifically paragraph [0145], and is illustrated in FIG. 11, Step S2000.

The acts for performing "priority parameter asymptotic means" are described in paragraphs [0147] through [0173], see specifically paragraph [0172], and is illustrated in Steps S2002-1, S2002-2,...S2002-n in FIG. 11.

The acts for performing "new normal gait parameter searching means" are described in paragraphs [0147] through [0173], see specifically paragraph [0172], and is illustrated in Steps S2004-1, S2004-2,...S2004-n in FIG. 11 and further in the flowcharts in FIGS. 12-15.

Accordingly, Applicant respectfully contends that specification adequately describes the means plus function limitations and, thus, respectfully request removal of the rejection.

The Examiner rejected claims 1 and 2 under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Applicant notes that claims 1 and 2 have been amended to overcome the Examiner's rejection. Specifically, claims 1 and 2 have been amended to include a control system that includes a gait generating device. Applicant, thus, respectfully requests removal of the rejection.

The Examiner rejected claims 3-9 under 35 U.S.C. 101 because they depend on claims 1 and 2 and they do not correct the deficiency of claims 1 and 2. Claims 3-9 depend on either claim 1 or claim 2, thus, any argument pertaining to claims 1 and 2 also apply to claims 3-9 and are herein incorporated by reference.

The Examiner rejected claim 1 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner stated that "priority parameter required value determining means," "base gait parameter setting means," "priority parameter asymptotic means," and "new gait parameter determining means" are disclosed in the specification but there is no definition or description of the limitations. Applicant respectfully disagrees.

The "priority parameter required value determining means" is described in paragraphs [0177] through [0180], see specifically paragraph [0179], and is step S026 in FIG. 9 and is illustrated in FIG. 16.

The "base gait parameter setting means" is described in paragraphs [0181] through [0187], see specifically paragraph [0186], and is illustrated in FIG. 17, Step S2100.

The "priority parameter asymptotic means" is described in paragraphs [0188] through [0212], see specifically paragraph [0210], and is illustrated in steps S2102-1, S2102-2,...S2102-n in FIG. 17.

The "new gait parameter determining means" is described in paragraphs [0188] through [0212], see specifically paragraph [0210], and is illustrated in steps S2104-1, S2104-2,...S2104-n in FIG. 17 and further in the flowcharts in FIGS. 14, 18, and 19.

The Examiner rejected claim 2 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the Examiner stated that "priority parameter required value determining means," "base gait parameter setting means," "priority parameter asymptotic means," and "new normal gait parameter searching means" are disclosed in the specification but there is no definition or description of the limitations. Applicant respectfully disagrees.

The "priority parameter required value determining means" is described in paragraphs [0127] through [0139], see specifically paragraph [0138], and is step S022 in FIG. 9 and is illustrated in FIG. 10.

The "base gait parameter setting means" is described in paragraphs [0141] through [0146], see specifically paragraph [0145], and is illustrated in FIG. 11, Step S2000.

The "priority parameter asymptotic means" is described in paragraphs [0147] through [0173], see specifically paragraph [0172], and is illustrated in Steps S2002-1, S2002-2,...S2002-n in FIG. 11.

The "new normal gait parameter searching means" is described in paragraphs [0147] through [0173], see specifically paragraph [0172], and is illustrated in Steps S2004-1, S2004-2,...S2004-n in FIG. 11 and further in the flowcharts in FIGS. 12-15.

The Examiner rejected claims 1-4, 6, and 7 under 35 U.S.C. 102(b) as being anticipated by Takagi U.S. Pat. Pub. No. 2002/0024312. Applicant assumes that claim 11 is also rejected under 35 U.S.C. 102(b) as being anticipated by Takagi

because the Examiner discusses claim 11 on page 11 of the Office action. Further, Although the Examiner did not expressly reject claim 10, Applicant assumes that claim 10 is rejected under 35 U.S.C. 102(b) as being anticipated by Takagi because claim 10 is the same as claim 11. The Examiner's rejection is traversed for the following reasons.

Applicant discloses a gait generating system for a mobile robot. The system determines a gait parameter based on multiple parameters that define a gait of the mobile robot in a predetermined period. The system then generates a desired gait using the determined gait parameter and a dynamic model of the robot. The gait generating system includes a control system that includes a gait generating device, which generates the desired gait of the mobile robot. The gait generating device includes a priority parameter required value determining means that determines a priority parameter required value. The priority parameter required value is a value of a priority parameter that satisfies a requirement when the requirement related to the desired gait is given. The priority parameter required value determining means is illustrated in FIG. 16 and includes steps S600 through S 612. Referring to paragraph [0177] of the present invention the parameters determined in FIG. 16 include a foot position/posture trajectory, a reference body posture trajectory, an arm posture trajectory, a floor reaction force vertical component trajectory, a floor reaction force horizontal component permissible range, and a ZMP trajectory. These parameters are determined based on sensor readings from a six-axis force sensor 50, a posture sensor 54, and from a rotary encoder 65 that detects a rotational amount of an electric motor 64 in each joint of the robot, see paragraph [0058]. Thus, The priority parameter required value determining means is

determining parameters that are dynamic. In other words, the parameters may change with each step the robot takes.

The gait generating device further includes a base gait parameter setting means to set a base gait parameter, which is either a gait parameter defining a reference gait of the mobile robot that is prepared beforehand or a gait parameter determined in the past so as to satisfy a predetermined boundary condition. A priority parameter asymptotic means is provided for updating the value of a priority parameter of the base gait parameter. This causes the value to gradually approach the priority parameter required value in steps until the value agrees with the priority parameter required value. A new gait parameter determining means determines a new gait parameter each time the value of the priority parameter is updated by the priority parameter asymptotic means. The new gait parameter is a gait parameter that has a priority parameter of the updated value and that allows a gait satisfying the predetermined boundary condition to be generated by using the dynamic model.

Takagi, on the other hand discloses a robot that identifies different users and reacts differently or performs different actions for each different user. Takagi includes an identification means to identify a user and an action control means for manifesting an action corresponding to the identity of the user. Information about the multiple users and the corresponding actions are preprogrammed in the robot's computer system. Thus, actions performed by the robot are programmed actions and are not based on a parameter of a current or past status of the robot. Accordingly, Takagi does not teach all the features of claim 1. Specifically Takagi does not teach "a priority parameter required value determining means for determining a priority parameter required value, which is the value of a priority

parameter to satisfy a requirement when the requirement related to the desired gait is given and a predetermined parameter out of the gait parameter is defined as the priority parameter while parameters except for the priority parameter are defined as non-priority parameters."

Rather, referring to FIG. 9, Takagi teaches a mobile robot that includes a user identification system to thereby identify a specific user from multiple users. The user identification system includes a sensor 101, a user identification information database 102, a user registration section 110, a user identification section 120, an action schedule section 130, an action instruction execution section 103, and an output section 104.

Information about each multiple user is registered or stored in advance in the user identification information database 102 by the user registration section 110. The user identification section 120 identifies the user based on an output from the sensor 101. Specifically, the sensor 101 detects a characteristic of the user based on an image of the user via a camera 20, a touch from the user via a touch sensor 21, or a voice of the user via a microphone 23. The user identification section 120 then identifies one user from the multiple users by comparing the information from the sensor 101 with the information stored in the user identification information database 102. Thus, robot is simply sensing pre-stored, non-changing information about a user. The robot does not sense dynamic information as in the present invention. Rather, the robot senses static or pre-stored information.

The Examiner cited paragraph [0132] and stated that Takagi teaches a priority parameter required value determining means. Paragraph [0132] of Takagi simply discloses that more frequent users have a higher priority as far as being

identified. In other words, if a particular user operates the robot more frequently than the other users the particular user's information will be compared to the user information stored in the user identification information database 102 first each time the particular user operates the robot. Paragraph [0132], however, does not disclose determining a priority parameter required value related to a gait.

Further, Takagi does not teach "a base gait parameter setting means for setting, as a base gait parameter, either a gait parameter defining a reference gait of the mobile robot that is prepared beforehand or a gait parameter determined in the past so as to satisfy a predetermined boundary condition."

The Examiner cited paragraph [0131] of Takagi and stated that Takagi teaches a base gait parameter setting means. Paragraph [0131] of Takagi simply discloses that priority may be given to a user to decrease the user identification process. Paragraph [0131], however, does not disclose determining a parameter related to a gait.

Still further, Takagi does not teach "a priority parameter asymptotic means for updating the value of a priority parameter of the base gait parameter so as to cause the value to gradually approach the priority parameter required value in steps until the value agrees with the priority parameter required value."

The Examiner cited paragraph [0073] of Takagi and stated that Takagi teaches a priority parameter asymptotic means. Paragraph [0073] simply discloses an emotion module 73 that holds parameters relating to 6 emotions, which are, joy, sadness, anger, surprise, disgust, and fear. Paragraph [0073], however, does not disclose determining a parameter related to a gait.

Finally, Takagi does not teach "a new gait parameter determining means for

determining in an exploratory manner a new gait parameter each time the value of the priority parameter is updated by the priority parameter asymptotic means, the new gait parameter being a gait parameter that has a priority parameter of the updated value and that allows a gait satisfying the predetermined boundary condition to be generated by using the dynamic model."

The Examiner cited paragraphs [0078] through [0086] of Takagi and stated that Takagi teaches a new gait parameter determining means. Paragraphs [0078] through [0086] simply disclose an instinct module 74 that holds four desires including the desire for exercise, the desire for affection, the desire for appetite, and the desire for curiosity. These parameters are simply "desires" to perform a function. The parameters are not related to determining a new gait parameter. Thus, paragraphs [0073] through [0086] do not disclose determining a parameter related to a gait.

Based on the foregoing, it is apparent that Takagi does not teach or suggest all the features of claim 1 and therefore cannot be cited as anticipating claim 1. Thus, reconsideration and withdrawal of the rejections of claim 1 based upon Takagi are hereby requested.

With reference to claim 2, claim 2 includes the similar features as claim 1. Thus, all arguments pertaining to claim 1 are equally applicable to claim 2 and will not be repeated.

Claims 3, 7 and 11 depend from claim 1 and claims 4, 6 and 10 depend from claim 2, thus, all arguments pertaining to claims 1 and 2 are equally applicable to these claims and are herein incorporated by reference.

The Examiner rejected claim 5 under 35 U.S.C. 103(a) as being unpatentable

over Takagi U.S. Pat. Pub. No. 2002/0024312, further in view of Iribe U.S. Pat. Pub. No. 2004/0176875. The Examiner's rejection is traversed for the following reasons.

Claim 5 depends from claim 1, thus, all arguments pertaining to claim 1 are equally applicable to claim 5 and are herein incorporated by reference.

Further, Applicant submits that Iribe does not correct or eliminate the deficiencies of the primary reference, Takagi, as they relate to claims 1 and 2. Iribe discloses a mobile legged robot that controls the motion of the legs, arms, and trunk unit in the event that the robot falls down to thereby limit the damage to the robot. Iribe, however, does not disclose a priority parameter required value determining means, as required by claims 1 and 2. Thus, Iribe does not correct or eliminate the deficiencies of Takagi as they relate to claims 1 and 2. Therefore, Applicant submits that claim 5 is allowable over the proposed combination of the references.

The Examiner rejected claims 8, 9, 12, and 13 under 35 U.S.C. 103(a) as being unpatentable over Takagi U.S. Pat. Pub. No. 2002/0024312, further in view of Furuta U.S. Pat. Pub. No. 2005/0001575. The Examiner's rejection is traversed for the following reasons.

Claims 8 and 12 depend from claim 1 and claims 9 and 13 depend from claim 2, thus, all arguments pertaining to claims 1 and 2 are equally applicable to these claims and are herein incorporated by reference.

Further, Applicant submits that Furuta does not correct or eliminate the deficiencies of the primary reference, Takagi, as they relate to claims 1 and 2. Furuta discloses a bipedal moving device and method to control the moving device. Furuta, however, does not disclose a priority parameter required value determining means, as required by claims 1 and 2. Thus, Furuta does not correct or eliminate

the deficiencies of Takagi as they relate to claims 1 and 2. Therefore, Applicant submits that claims 8, 9, 12, and 13 are allowable over the proposed combination of the references.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. SAT-16756.

Respectfully submitted,

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